

yellowish hue. From my examination of the specimens the plant is in all other respects typical. I will designate it *Vaccinium canadense*, forma **chiococcum**.

Prof. Wm. G. Farlow records white-fruited *Vaccinium canadense* from Shelburne, New Hampshire (Garden and Forest, II, 1889, pp. 50, 51). This form should be entered in my list with a cross for Maine and a line for New Hampshire.

I will mention two records outside of New England. *Vaccinium vacillans* with white berries is recorded from the sand region east of Chicago, Illinois, by Mr. E. J. Hill (Garden and Forest, VIII, 1895, p. 503). He says that the plants are known to the berry pickers, thus indicating that the form is a persistent one, and he thinks that the seeds are fertile.

Prof. Thos. C. Porter in 1889 (Bull. Torr. Club, XVI, p. 21) records white-berried *Gaylussacia resinosa* from Pennsylvania and New Jersey.

The writer will be very glad to hear of any other stations in New England or elsewhere for white-berried forms of *Vaccinium* or *Gaylussacia*.

CAMBRIDGE, MASSACHUSETTS.

MISCELLANEOUS NOTES ON NEW ENGLAND FERNS,— II.

GEORGE E. DAVENPORT.

3. In the course of these notes some important changes will be adopted, but in all cases such explanations will be given as will render the reasons therefore clearly understood.

For instance: — The Lady fern, until quite recently, has been known to American fern students as *Asplenium filix-foemina* although Prof. Eaton, and Dr. Underwood have recognized Roth's *Athyrium* as a section of *Asplenium* in accordance with the treatment of Hooker and Baker.

Many excellent authorities, however, have regarded *Athyrium* as wholly distinct from *Asplenium* and kept the two apart. The former appears to be well represented by a group of ferns quite distinct in habit, structure and the character of their sori from *Asplenium*

as now understood, and there appears to be a steadily increasing tendency towards its more general recognition.

The latter genus (*Asplenium*), as defined by Linnaeus, originally embraced all ferns with their sori arranged in lines diverging from the midribs, but in, or about 1800 (exact date uncertain), Roth¹ noticed that certain species of *Asplenium* produced a large proportion of peculiarly curved sori mixed with the regular straight (asplenioid) form, and deeming this to be of sufficient importance to constitute a new generic character, he founded upon it his genus *Athyrium*. As the special character of the athyrioid sori is the subject of the following note there is no need of dwelling on it further here, but it is a little singular that the very first species mentioned by Roth, *A. fontanum*, under his new genus should have asplenioid sori, so that if it were not for the clear and unmistakable description of the *semi-lunar* sori as he called them in his text, and his explicit declaration that it was these *semi-lunar* sori which led him to propose a new genus, the validity of the genus itself might be seriously questioned.

John Smith (in "Historia Filicum") says of it that it is better represented by the habits and character of the ferns comprising it than by the shape of the sori, but Moore more correctly apprehended Roth's views in saying that the genus is best known by the character of its peculiar sori.

Probably the truth of the matter may be in the combination of all of these characters, as it is certain that true *Athyria* may be quite as readily distinguished from *Asplenium* by their habits, and the more compound structure of the fronds as by the peculiarities of their sori. This combination of characters may readily be seen in the Lady fern, and as the athyrioid sori largely predominate in that species it has become the accepted type for *Athyrium*.

¹The genus *Athyrium* was first published by Albrecht Wilhelm Roth in Tentamen Florae Germanicae, "which was published in three volumes extending from 1788 to 1800. The Ferns were published in Volume 3, which is dated 1800, but Pfeiffer cites 1797, and 1798 is sometimes given as the date when the genus was first proposed, that being the date of the Preface (Sept. 14). According to Dr. Underwood (see an excellent historical "Review of the Genera of Ferns," reprinted from Memoirs Torrey Botanical Club, 1899) Bernhardt quoted Roth's genera in 1799, which would indicate an earlier appearance than the date of the volume itself.

The name *Athyrium* is derived by Wittstein (*Etymologisch-botanisches Handwörterbuch*, 83) from α privative and $\theta\upsilon\rho\epsilon\acute{o}s$, a shield, on the ground that Roth must have meant that the sorus having the indusium solely on one side, is in a sense without a shield. Lowe (Our Native Ferns, ii. p. 4) inclines to the belief that the name is from the Greek "Athyros — opened."

In addition to the characters mentioned, Dr. Milde laid much stress on the character of the fibro-vascular bundles in the stipe, and it is certain that in *A. filix-foemina*, at least, the two somewhat crescent-shaped bundles in the lower portion of the stipe are partially crooked at the upper ends and retain a partial resemblance to the hamate form of the sori, even after the bundles themselves become united in the upper portion of the stipe and rachis, into the single U-shaped form.

The genus is pretty generally accepted abroad at the present time, and has been adopted in this country by Shimek, Maxon, Clute and Gilbert in their recent publications. On this account I have decided, after mature deliberation, to adopt it myself, as this seems to be one of those instances where the general concensus of views among the best authorities should prevail. Accordingly the subject of the following note will be designated as *Athyrium filix-foemina*, instead of *Asplenium filix-foemina* as heretofore.

4. THE INDUSIUM OF ATHYRIUM FILIX-FOEMINA, Roth (Tent. Fl. Ger., iii, 65).— During the early months of the present year (1901) I devoted a great deal of time to an examination of the early states of the sori in *Athyrium filix-foemina*, principally for the purpose of comparisons between the common forms of the Lady fern and the California plant known as *A. cyclosorum*, which has the margins of the indusia in their early states ciliated with jointed hairs (B. D. Gilbert).

The indusium of *A. filix-foemina* is variously described and figured by different authors whose descriptions and figures do not always agree. Generally the indusium is described as having a jagged or toothed margin fringed with cilia, even when the figures represent an entire, or nearly entire margin. These discrepancies are due to the great diversity in the character of the species itself, specimens of which vary according to their form or age. But according to the majority of descriptions the indusium has a lacerated and ciliated margin, and such a character is figured by good authorities as the type form for the species.

Yet during the months of May and June, I examined many hundreds of fronds in all stages of development without once finding any such type.

In the greater number of sori examined the margin of the indusium was either entire, or only very slightly erose, or sinuately notched, so

that it began to look as if some unusually extreme condition had been selected for the type form.

Finally, however, I began to find some ciliated indusia, and well into July both Miss Slosson and myself found lacerated and ciliated indusia in abundance. Thus contrary to my expectation of finding ciliated margins on the earliest fronds as appears to be the case with the California *cyclosorum*, they were not found until the later fronds of midsummer developed.

About the middle of July Miss Slosson sent to me from Mattapoisett some fresh specimens with a large percentage of ciliated indusia, but as I was unable at the time to give them an immediate examination the specimens were put under a loose pressure for temporary preservation, and when taken out later on were found to be apparently without cilia, the cilia having either dried up, or become rubbed off through pressure. This shows them to be extremely fugacious. It is certain also that when present in nature they gradually disappear as the sori mature, so that beyond a certain stage of development they are seldom seen. It is also certain that they occur more abundantly on some forms than on others, but I am convinced that so far as our New England forms are concerned they should not be figured as the type form for the species without at least some clearer explanations than are usually given.

The sori in *Athyrium filix-foemina* exhibit three well marked forms, the first being nearly straight or slightly curved on the back, as in true *Asplenium*; the second being partially recurved at one end like a Bishop's crook, and the third being wholly recurved like a horse-shoe in shape. In the latter form the two ends approach each other so closely as to make the sorus appear reniform, as in *Nephrodium*, for which specimens have sometimes been mistaken. In some of the more delicate small field and woodland forms the small roundish matured sori look so much like those of *Phegopteris* that specimens are often very puzzling to novices, but a little attention to the cutting of the frond, and the venation, will soon overcome the difficulty. There is, too, an indefinable charm about the various forms of the Lady fern which soon enables one to know it from its peculiarly graceful motion by merely gently swaying a frond in the hand.

In all three forms of the sori the indusium may be either entire, sinuated, toothed or jagged, and either with or without the hairlike projections called *cilia*, which gradually disappear with age.

The different forms of the sori are technically designated as first, *linear*, or straight (*asplenoid*); second *hamate*, i. e., like a Bishop's crook, or staff, and third *hippocrepiform*, in shape like a horseshoe, the two latter forms being *athyrioid* in character.

All three of these forms occur in greater or less proportions on the same plant, and even on the same frond, but the hamate and hippocrepiform sori occur in greater proportion on some forms than on others, and it was the preponderance of such forms that led Roth to found the genus.

From all this it will be seen that *Athyrium* is chiefly characterized by the production of *hamate* and *hippocrepiform* sori, and that *Athyrium filix-foemina* is its best type.

The only other member of the genus in New England is *Athyrium thelypteroides*, Desvaux, which may be the subject of another note later on.

MEDFORD, MASSACHUSETTS.

THE NORTH AMERICAN EUPHRASIAS.

B. L. ROBINSON.

It has long been recognized by New England botanists that the attractive little Eyebrights of our northern borders present much more diversity than is indicated in current floras. The appearance of Prof. von Wettstein's elaborate monograph of the genus *Euphrasia*, published in 1896, was, therefore, a matter of much interest and many efforts have been made to bring our forms under the species of the New and Old World therein so carefully described. However, the results have been only partially successful. It is true that the separation of *E. latifolia* of arctic America and the specific distinction of the diminutive *E. Oakesii* of the White Mountains have given some relief to the traditional and overcrowded *E. officinalis*, but even with the addition of *E. americana*, Wettst. and the later *E. canadensis*, Townsend, it has still been impossible to find satisfactory categories for several of our forms. This has arisen from no lack of clearness in the detailed descriptions and excellent key of the monograph but from the evident fact that its author, while able to examine a great